

In the Claims

Claim 1 (original): A packaging insertion apparatus for inserting flexible bags into packaging containers, comprising:

a container receiving area for receiving containers being supplied to the insertion apparatus;

a bag dispenser for dispensing flexible bags to a position adjacent the container receiving area for insertion of the flexible bags into the containers;

at least one movable vacuum head for engaging a flexible bag supplied by the bag dispenser to allow the flexible bag to be positioned for insertion into a container positioned in the container receiving area;

at least one vacuum head operator for moving the at least one movable vacuum head into engagement with the flexible bag supplied by the bag dispenser and for positioning the flexible bag for insertion into the container held in the container receiving area;

at least one insertion assembly having a mandrel for engaging the flexible bag which is to be inserted into the container held in the container receiving area, wherein the insertion assembly has a retracted position where the mandrel is ready to engage and insert the flexible bag into the container in the container receiving area, and an extended position where the mandrel is positioned within the container in the container receiving area having inserted the flexible bag into the container;

wherein the at least one movable vacuum head is movable into engagement with a subsequent flexible bag held by the bag dispenser while the mandrel is in the extended position.

Claim 2 (original): The apparatus of claim 1, wherein the at least one movable vacuum head includes two movable vacuum heads.

Claim 3 (original): The apparatus of claim 1, wherein the at least one movable vacuum head includes a plurality of movable vacuum heads.

Claim 4 (original): The apparatus of claim 1, wherein the at least one movable vacuum head may be controllably moved to engage the flexible bag supplied by the bag dispenser while the mandrel is in the extended position.

Claim 5 (original): The apparatus of claim 2, wherein each of the movable vacuum heads may be controllably moved along opposite sides of the mandrel to engage the flexible bag supplied by the bag dispenser, and which may further be controllably moved to assist in positioning the flexible bag for insertion into the container.

Claim 6 (original): The apparatus of claim 1, and further comprising at least one rear vacuum head which may be controllably moved to assist the at least one movable vacuum head in engaging the flexible bag held by the bag dispenser.

Claim 7 (original): The apparatus of claim 1, and further comprising a cuffing assembly adapted for use in cuffing an open end of the flexible bag over top edges of the container into which the flexible bag was inserted.

Claims 8-10 (canceled).

Claim 11 (currently amended): The apparatus of claim 7 8, wherein the cuffing assembly comprises:

at least one cuffing finger positioned on two opposing sides of the container;
at least one actuating means operably coupled to the cuffing fingers for selectively moving the cuffing fingers between a first position to facilitate initial placement of the mandrel and the flexible bag into the container, and a second position in which the cuffing fingers are adapted to spread the open end of the flexible bag and invert the open end of the flexible bag over the top edges of the container; the at least one actuating means ~~operably coupled to the cuffing fingers includes~~ including two separate rotational actuating means for selectively moving the cuffing fingers between the first position and the second position.

Claim 12 (original): The apparatus of claim 7, wherein the insertion assembly includes a mandrel.

Claims 13-26 (canceled).

Claim 27 (original): A method of inserting flexible bags into packaging containers, comprising the steps of:

dispensing flexible bags from a bag dispenser for insertion of the flexible bags into containers;

engaging a flexible bag supplied by the bag dispenser with at least one movable vacuum head;

positioning the flexible bag for insertion into a container by moving the at least one movable vacuum head;

inserting the flexible bag into the container with an insertion assembly, by moving the insertion assembly to an extended position; and

engaging a subsequent flexible bag held by the bag dispenser with the at least one movable vacuum head while the insertion assembly is in the extended position having inserted the flexible bag into the container.

Claim 28 (original): A method according to claim 27, wherein after the inserting, the method further comprises cuffing an open end of the flexible bag over top edges of the container into which the flexible bag was inserted.

Claim 29 (original): The method of claim 27, wherein the moving at least one moveable vacuum head to the bag dispenser to engage a flexible bag comprises moving two movable vacuum heads along separate paths on opposite sides of the insertion assembly toward the bag dispenser to engage the flexible bag supplied by the bag dispenser.

Claim 30 (original): The method of claim 27, wherein the engaging the flexible bag comprises bringing the at least one vacuum head into apposition with the flexible bag supplied by the bag dispenser and developing sufficient vacuum pressure so that the flexible bag will substantially adhere to the at least one movable vacuum head.

Claim 31 (original): The method of claim 27, wherein the moving the vacuum head to position the flexible bag for insertion into the container in the container receiving area comprises moving at least a portion of an open end of the flexible bag so that the open end of the flexible bag will accept the insertion assembly.

Claim 32 (original): A method of inserting flexible bags into packaging containers, comprising the steps of:

supplying containers to a container receiving area;

dispensing flexible bags from a bag dispenser to the container receiving area for insertion of the flexible bags into the containers;

moving at least one moveable vacuum head to engage a flexible bag;

engaging the flexible bag with the at least one vacuum head so that the flexible bag may be positioned for insertion into the container positioned in the container receiving area;

moving the vacuum head to position the flexible bag for insertion into the container positioned in the container receiving area;

inserting the flexible bag into the container positioned in the container receiving area using an insertion apparatus; and

moving the at least one vacuum head to the bag dispenser and into engagement with a subsequent flexible bag supplied by the bag dispenser while the insertion apparatus is in an extended position having inserted the flexible bag into the container positioned within the container receiving area.

Claim 33 (previously presented): An apparatus for inserting a flexible liner into a packaging container, comprising:

a liner supply for supplying a flexible liner to be inserted into a container;

at least one liner engagement head for controllably engaging a flexible liner supplied by the liner supply and positioning the liner for insertion into a container positioned in a container receiving area;

at least one insertion assembly which is movable between retracted and extended positions, said at least one insertion assembly being movable into an extended position to insert a liner into a container positioned in the container receiving area;

wherein said at least one liner engagement head is movable into engagement with a liner held by the liner supply while the at least one insertion assembly is in an extended position inserting another liner into a container positioned in the container receiving area.

Claim 34 (previously presented): An apparatus according to claim 33 and wherein said at least one liner engagement head includes at least one movable liner engagement head that is mounted to move and open a liner by separating two opposing leaves of the liner.

Claim 35 (previously presented): An apparatus according to claim 33 and wherein the liner supply is a dispenser that supplies liners from a roll.

Claim 36 (previously presented): An apparatus according to claim 33 and wherein said at least one liner engagement head includes at least one vacuum engagement head that applies vacuum when engaging a liner.

Claim 37 (previously presented): An apparatus according to claim 33 and wherein: said at least one liner engagement head includes at least one vacuum engagement head that applies vacuum when engaging a liner;

said at least one liner engagement head includes at least one movable liner engagement head that is mounted to move and open a liner by separating two opposing leaves of the liner.

Claim 38 (previously presented): An apparatus according to claim 33 and wherein said at least one liner engagement head includes a plurality of vacuum engagement heads that apply vacuum when engaging a liner.

Claim 39 (previously presented): An apparatus according to claim 33 and wherein said at least one liner engagement head includes at least two opposing liner engagement heads that are in opposed relationship and engage opposing leaves of a liner.

Claim 40 (previously presented): An apparatus according to claim 33 and wherein:
said at least one liner engagement head includes at least two opposing liner engagement heads that are in opposed relationship and engage opposing leaves of a liner;
said at least one liner engagement head also including at least one vacuum engagement head that applies vacuum when engaging a liner.

Claim 41 (previously presented): An apparatus according to claim 33 and wherein:
said at least one liner engagement head includes at least two pair of opposing liner engagement heads, each pair of opposing liner engagement heads having opposing liner engagement heads that are in opposed relationship and engage opposing leaves of a liner;
said at least two pair of opposing liner engagement heads being mounted with at least one pair of opposing liner engagement heads along different sides of the at least one insertion assembly;
at least one engagement head of each of said pair of opposing liner engagement heads being mounted for movement and being movable along engagement head paths which pass along sides of the at least one insertion assembly while the at least one insertion assembly is in said extended position.

Claim 42 (previously presented): An apparatus according to claim 33 and wherein:

said at least one liner engagement head includes at least two pair of opposing liner engagement heads, each pair of opposing liner engagement heads having opposing liner engagement heads that are in opposed relationship and engage opposing leaves of a liner;

said at least two pair of opposing liner engagement heads being mounted with at least one pair of opposing liner engagement heads along different sides of the at least one insertion assembly;

at least one engagement head of each of said pair of opposing liner engagement heads being mounted for movement and being movable along engagement head paths which pass along sides of the at least one insertion assembly while the at least one insertion assembly is in said extended position;

said at least one liner engagement head also including at least one vacuum engagement head that applies vacuum when engaging a liner.

Claim 43 (previously presented): An apparatus according to claim 33 and wherein

said at least one liner engagement head includes at least one pivotal engagement head which is pivotally movable to engage with a liner.

Claim 44 (previously presented): An apparatus according to claim 33 and wherein:

said at least one liner engagement head includes at least one pivotal engagement head which is pivotally movable to engage with a liner;

said at least one liner engagement head includes at least one linear engagement head which is linearly movable to engage with a liner.

Claim 45 (previously presented): An apparatus according to claim 33 and wherein:

said at least one liner engagement head includes at least two pair of opposing liner engagement heads, each pair of opposing liner engagement heads having opposing liner engagement heads that are in opposed relationship and engage opposing leaves of a liner;

said at least two pair of opposing liner engagement heads being mounted with at least one pair of opposing liner engagement heads along different sides of the at least one insertion assembly;

at least one engagement head of each of said pair of opposing liner engagement heads being mounted for movement and being movable along engagement head paths which pass along sides of the at least one insertion assembly while the at least one insertion assembly is in said extended position;

said at least one liner engagement head also including at least one vacuum engagement head that applies vacuum when engaging a liner;

said at least one liner engagement head includes at least one pivotal engagement head which is pivotally movable to engage with a liner;

said at least one liner engagement head includes at least one linear engagement head which is linearly movable to engage with a liner.

Claims 46-61 (canceled).

Claim 62 (previously presented): An apparatus for inserting a flexible liner into a packaging container, comprising:

at least one liner supply for supplying a flexible liner to be inserted into a container;

at least one liner engagement head for controllably engaging a flexible liner supplied by the liner supply and positioning the liner for insertion into a container positioned in a container receiving area;

at least one insertion assembly which is movable between retracted and extended positions, said at least one insertion assembly being movable into an extended position to insert a liner into a container positioned in the container receiving area;

at least one cuffing assembly for cuffing a portion of the liner over edges of the container;

wherein said at least one liner engagement head is movable into engagement with a liner held by the liner supply while the at least one insertion assembly is in an extended position inserting another liner into a container positioned in the container receiving area.

Claim 63 (canceled).

Claim 64 (previously presented): An apparatus according to claim 62 and wherein said at least one liner engagement head includes at least one movable liner engagement head that is mounted to move and open a liner by separating two opposing leaves of the liner.

Claim 65 (previously presented): An apparatus according to claim 62 and wherein the liner supply is a dispenser that supplies liners from a roll.

Claim 66 (previously presented): An apparatus according to claim 62 and wherein said at least one liner engagement head includes at least one vacuum engagement head that applies vacuum when engaging a liner.

Claim 67 (previously presented): An apparatus according to claim 62 and wherein:
said at least one liner engagement head includes at least one vacuum engagement head that applies vacuum when engaging a liner;

said at least one liner engagement head includes at least one movable liner engagement head that is mounted to move and open a liner by separating two opposing leaves of the liner.

Claim 68 (previously presented): An apparatus according to claim 62 and wherein said at least one liner engagement head includes a plurality of vacuum engagement heads that apply vacuum when engaging a liner.

Claim 69 (previously presented): An apparatus according to claim 62 and wherein said at least one liner engagement head includes at least two opposing liner engagement heads that are in opposed relationship and engage opposing leaves of a liner.

Claim 70 (previously presented): An apparatus according to claim 62 and wherein:
said at least one liner engagement head includes at least two opposing liner engagement heads that are in opposed relationship and engage opposing leaves of a liner;
said at least one liner engagement head also including at least one vacuum engagement head that applies vacuum when engaging a liner.

Claim 71 (previously presented): An apparatus according to claim 62 and wherein:
said at least one liner engagement head includes at least two pair of opposing liner engagement heads, each pair of opposing liner engagement heads having opposing liner engagement heads that are in opposed relationship and engage opposing leaves of a liner;
said at least two pair of opposing liner engagement heads being mounted with at least one pair of opposing liner engagement heads along different sides of the at least one insertion assembly;
at least one engagement head of each of said pair of opposing liner engagement heads being mounted for movement and being movable along engagement head paths which pass along sides of the at least one insertion assembly while the at least one insertion assembly is in said extended position.

Claim 72 (previously presented): An apparatus according to claim 62 and wherein:

said at least one liner engagement head includes at least two pair of opposing liner engagement heads, each pair of opposing liner engagement heads having opposing liner engagement heads that are in opposed relationship and engage opposing leaves of a liner;

said at least two pair of opposing liner engagement heads being mounted with at least one pair of opposing liner engagement heads along different sides of the at least one insertion assembly;

at least one engagement head of each of said pair of opposing liner engagement heads being mounted for movement and being movable along engagement head paths which pass along sides of the at least one insertion assembly while the at least one insertion assembly is in said extended position;

said at least one liner engagement head also including at least one vacuum engagement head that applies vacuum when engaging a liner.

Claim 73 (previously presented): An apparatus according to claim 62 and wherein

said at least one liner engagement head includes at least one pivotal engagement head which is pivotally movable to engage with a liner.

Claim 74 (previously presented): An apparatus according to claim 62 and wherein:

said at least one liner engagement head includes at least one pivotal engagement head which is pivotally movable to engage with a liner;

said at least one liner engagement head includes at least one linear engagement head which is linearly movable to engage with a liner.

Claim 75 (previously presented): An apparatus according to claim 62 and wherein:

said at least one liner engagement head includes at least two pair of opposing liner engagement heads, each pair of opposing liner engagement heads having opposing liner engagement heads that are in opposed relationship and engage opposing leaves of a liner;

said at least two pair of opposing liner engagement heads being mounted with at least one pair of opposing liner engagement heads along different sides of the at least one insertion assembly;

at least one engagement head of each of said pair of opposing liner engagement heads being mounted for movement and being movable along engagement head paths which pass along sides of the at least one insertion assembly while the at least one insertion assembly is in said extended position;

said at least one liner engagement head also including at least one vacuum engagement head that applies vacuum when engaging a liner;

said at least one liner engagement head includes at least one pivotal engagement head which is pivotally movable to engage with a liner;

said at least one liner engagement head includes at least one linear engagement head which is linearly movable to engage with a liner.

Claim 76 (previously presented): A method for inserting flexible liners into packaging containers, comprising:

supplying a container to a container receiving area associated with a liner insertion apparatus;

dispensing a first liner to a dispensed position of the liner insertion apparatus;

engaging the first liner using at least one movable engagement head;

positioning the first liner using said at least one movable engagement head to prepare the first liner for insertion;

inserting the first liner into the container by extending at least one insertion assembly of the liner insertion apparatus against the first liner and into the container positioned in the container receiving area;

dispensing a second liner to a dispensed position of the liner insertion apparatus;

moving said at least one movable engagement head into engagement with the second liner while the at least one insertion assembly is in an extended position associated with said inserting step.

Claim 77 (previously presented): A method according to claim 76 and wherein said step of engaging the first liner includes applying vacuum to said first liner.

Claim 78 (previously presented): A method according to claim 76:

and wherein said step of engaging the first liner includes applying vacuum to said first liner;

and further comprising engaging the second liner with said at least one movable engagement head, and wherein said step of engaging the second liner includes applying vacuum to said second liner.

Claim 79 (previously presented): A method according to claim 76 and further comprising:

retracting said at least one insertion assembly;

removing said container with first liner inserted therein from the container receiving area;

supplying a second container to the container receiving area;

positioning the second liner using said at least one movable engagement head to prepare the second liner for insertion;

inserting the second liner into the second container by extending said at least one insertion assembly against the second liner and into the second container positioned in the container receiving area.

Claim 80 (previously presented): A method according to claim 76 and wherein said step of engaging the first liner includes engaging the first liner with at least two movable engagement heads which are moved along opposing sides of the at least one insertion assembly.

Claim 81 (previously presented): A method according to claim 76 and wherein said step of engaging the first liner includes engaging the first liner with at least two opposing engagement heads that engage opposing leaves of the liner.

Claim 82 (previously presented): A method according to claim 76:
and wherein said step of engaging the first liner includes engaging the first liner with at least two opposing engagement heads that engage opposing leaves of the liner;
and further comprising opening the first liner by separating opposing leaves of the liner by moving at least one of said opposing engagement heads.

Claim 83 (previously presented): A method according to claim 76 and wherein:
said step of engaging the first liner includes engaging the first liner with at least two movable engagement heads which are moved along opposing sides of the at least one insertion assembly;
said step of engaging the first liner includes engaging the first liner with at least two opposing engagement heads that engage opposing leaves of the liner.

Claim 84 (previously presented): A method according to claim 76 and wherein:

said step of engaging the first liner includes engaging the first liner with at least two movable engagement heads which are moved along opposing sides of the at least one insertion assembly;

said step of engaging the first liner includes engaging the first liner with at least two opposing engagement heads that engage opposing leaves of the liner;

and further comprising opening the first liner by separating opposing leaves of the liner by moving at least one of said opposing engagement heads.

Claims 85-87 (canceled).

Claim 88 (previously presented): A method according to claim 76 and wherein said step of engaging the first liner includes engaging the first liner with at least two opposing engagement heads that engage opposing leaves of the liner;

and further comprising:

opening the first liner by separating opposing leaves of the liner by moving at least one of said opposing engagement heads;

engaging the first liner by rotating at least one cuffing assembly which engages the first liner and assists in keeping the first liner in an open condition;

cuffing the first liner about portions of the container by moving said at least one cuffing assembly relative to the container and against the first liner as the first liner is in juxtaposition with the container.

Claim 89 (previously presented): A method for inserting a flexible liners into packaging containers, comprising:

supplying a first container to a container receiving area associated with a liner insertion apparatus;

dispensing a first liner to a dispensed position of the liner insertion apparatus;

engaging the first liner using at least one movable engagement head;

opening the first liner using said at least one movable engagement head to open and position the first liner for insertion;

inserting the first liner into the first container by extending at least one insertion assembly into the first liner and into the first container positioned in the container receiving area;

dispensing a second liner to a dispensed position of the liner insertion apparatus;

moving said at least one movable engagement head into engagement with the second liner while the insertion assembly is still in an extended position relative to said first liner;

engaging the second liner using the at least one movable engagement head;

retracting said at least one insertion assembly;

removing said first container with first liner inserted therein from the container receiving area;

supplying a second container in the container receiving area;

opening the second liner using said at least one movable engagement head to open and position the second liner for insertion;

inserting the second liner into the container by extending said at least one insertion assembly into the second liner and into the second container positioned in the container receiving area.

Claim 90 (previously presented): A method according to claim 89 and wherein said steps of engaging the first liner and engaging the second liner include applying vacuum to said first liner and to said second liner, respectively.

Claim 91 (previously presented): A method according to claim 89 and wherein said steps of engaging the first liner and engaging the second liner include applying vacuum to said first liner and to said second liner so as to apply vacuum to opposing leaves of the liners, respectively.

Claim 92 (previously presented): A method according to claim 89 and wherein said at least one movable engagement head includes at least two movable engagement heads which move along opposing sides of the at least one insertion assembly.

Claim 93 (previously presented): A method according to claim 89 and wherein:

said steps of engaging the first and second liners include engaging the first and second liners with at least two movable engagement heads which are moved along opposing sides of the at least one insertion assembly;

said steps of engaging the first and second liners include engaging the first and second liners with at least two opposing engagement heads that engage opposing leaves of the liner.

Claims 94-106 (canceled).